## AMENDMENTS TO THE CLAIMS

1. (Currently Amended) An optimal operation controller of a plant comprising:

a correlation analyzing unit for performing regression analysis to obtain a ~~obtaining~~ correlation between ~~a state~~ an operative parameter of a predetermined process and each of ~~one or more~~ a plurality of operation elements based on an operation status of the plant to be controlled, storing the correlation in a correlation table, and computing operation efficiency for each operation element based on the operation status of the plant, wherein said correlation analyzing unit uses data collected from the plant during a prior implementation of the predetermined process to perform the regression analysis and compute the operation ~~efficiency~~ efficiencies of the operation elements;

a categorization efficiency table for storing the operation efficiency of ~~the predetermined process~~ each operation element computed by the correlation analyzing unit in association with a highly correlative operative parameter of the predetermined process as determined by the regression analysis, wherein the categorization efficiency table further stores a relationship between the operation efficiency of each operation element and the overall efficiency of the predetermined process determined based on the data collected during the prior implementation; and

an optimal pattern searching unit for performing a look-up of the categorization efficiency table based on data collected from the plant during a subsequent implementation of the predetermined process in order to output an instruction to control each of the ~~one or more~~ operation elements during the subsequent implementation of the predetermined process without simulating or computing an operation efficiency.

2. (Currently Amended) The optimal operation controller of the plant of claim 1, wherein:

the categorization efficiency table stores the operation efficiency for ~~an~~ each operation element and the operation efficiency of an entire plant, and

the optimal pattern searching unit controls ~~the~~ each operation element in consideration of the operation efficiency of the entire plant.

3. (Currently Amended) The optimal operation controller of the plant of claim 1, wherein the correlation analyzing unit categorizes the correlation between the state of the predetermined process and each ~~of the one or more~~ operation element ~~elements~~ into specific steps based on the data input from the plant to be controlled, and writes the correlation in the correlation table.

4. (Previously Presented) The optimal operation controller of the plant of claim 3, wherein

the categorization efficiency table stores data of an approximated curve generated by the categorized correlation, and

the optimal pattern searching unit outputs the instruction by referring to the data of the approximated curve.

5. (Currently amended) An method of performing optimal operation control of a plant, comprising:

~~obtaining~~ performing regression analysis to obtain a correlation between ~~a state~~ an operative parameter of a predetermined process and each of ~~one or more~~ a plurality of operation elements based on an operation status of the plant to be controlled, wherein the regression analysis is performed using data collected from the plant during a prior implementation of the predetermined process,

storing the correlation obtained by the correlation analyzing step into a correlation table,

computing efficiency for each of the one or more operation elements based on the operation status of the plant, wherein the computing step uses the data collected from the plant during ~~a~~ the prior implementation of the predetermined process,

storing, in a categorization efficiency table, the operation efficiency of ~~the predetermined process~~ each operation element obtained by the efficiency computing step and a highly correlative operative parameter of the predetermined process as determined by the regression analysis, ~~into a categorization efficiency table, and~~

storing, in the categorization efficiency table, a relationship between the operation efficiency of each operation element and the overall efficiency of the predetermined process determined based on the data collected during the prior implementation, and

performing a look-up of the categorization efficiency table based on data collected from the plant during a subsequent implementation of the predetermined process in order to output an instruction to control each of the ~~one or more~~ operation

elements during the subsequent implementation of the predetermined process without simulating or computing operation efficiency.

6. (Canceled)

7. (Currently Amended) The optimal operation controller of claim 5, ~~6,~~ wherein the plurality of operation elements are devices for configuring the plant during the predetermined process.

8. (Currently Amended) The method of claim 5, further comprising:

storing the operation efficiency for each ~~of the one or more~~ operation element ~~elements~~ and of the entire plant in the categorization efficiency table, and

controlling each ~~of the one or more~~ operation element ~~elements~~ in consideration of the operation efficiency of the entire plant.

9. (Currently Amended) The method of claim 5, further comprising:

categorizing the correlation between the state of the predetermined process and each ~~of the one or more~~ operation element ~~elements~~ into specific steps based on the data input from the plant to be controlled, and

writing the correlation in the correlation table.

10. (Previously Presented) The method of claim 9, further comprising:

storing data of an approximated curve generated by the categorized correlation in the categorization correlation table, and

referring to the data of the approximated curve when performing the look-up of the categorization correlation table in order to output the control instruction.

11. (Currently Amended) The method of claim 5, wherein the predetermined process involves ~~a~~ the plurality of operation elements~~, the method further comprising:~~

~~storing the operation efficiency of each of the plurality of operation elements in the categorization correlation table~~.

12. (Previously Presented) The method of claim 11, wherein the plurality of operation elements are devices for configuring the plant during the predetermined process.

13. (Currently Amended) A method for controlling ~~a~~ devices in a plant in order to optimize the operation of the plant during a process, comprising:

collecting operational data from the plant during a first implementation of the process, the collected operational data relating to one or more ~~an~~ operational parameters of the plant and ~~an~~ outputs of the devices;

calculating an efficiency value ~~values~~ for each of the devices based on the collected operational data;

performing regression analysis to correlate ~~correlating~~ changes in the one or more operational parameters to the calculated efficiency values of the respective devices based on the collected operational data to generate correlation values;

storing the generated correlation values in a correlation ~~look-up~~ table;

storing each of the calculated efficiency values of the devices in a look-up table in association with a highly correlative operating parameter of the process as determined by the regression analysis;

storing a relationship between each of the calculated efficiency values of the devices and an overall efficiency of the process in the look-up table, the relationship being determined based on the collected operational data; and

referring to the look-up table in order to output a control instruction to each of the devices during a second implementation of the process without simulating or computing efficiency, wherein the second implantation of the process occurs subsequent to the first implementation.

14. (Currently Amended) The method of claim 13, wherein

the generated correlation values are stored in the look-up table in response to ~~correlating step includes~~ determining that an ~~the~~ operational parameter has a strong effect on efficiency of at least one of the devices based on the regression ~~by performing statistical~~ analysis being performed on the generated correlation values, and

the generated correlation values are stored in the look-up table in response to the determination of the strong effect.

15. (Currently Amended) The method of claim 14, wherein

the collected operational data includes a plurality of variables related to the operation of the plant during the process, and

the correlating step includes calculating a correlation coefficient for each of the variables according to the performed regression ~~statistical~~ analysis, the one or more operational parameters being selected from the variables on the basis of the correlation coefficients.

16. (Previously Presented) The method of claim 13, wherein the collected operational data is continuously sampled as an output quantity of the process changes, the method further comprising:

categorizing the sampling points of the collected operational data into a number of specific steps corresponding to a number of instructions for specifying an output quantity of the process.

17. (Currently Amended) The method of claim 13, ~~further comprising:~~

~~calculating efficiency values for the entire plant based on the collected operational data;~~

wherein the correlating step determines a relationship between efficiency of at least one of the devices and efficiency of the entire plant, the control instruction being output to the at least one of the devices based on the determined relationship.

18. (Currently Amended) The method of claim 17, wherein

~~the device is one of a plurality of devices to which control instructions are output by referring to the look-up table, the operational parameter being related to the operation of at least one of the other devices, and~~

~~———~~the control instructions are output to the plurality of devices in order to maximize the efficiency of the entire plant.

19. (Canceled)

20. (Previously Presented) The method of claim 13, wherein the method is performed for a water conveyance system to optimize conveyance of water to a plurality of pump stations.